FOX 4G Matrix 14400

MODULAR FIBER OPTIC MATRIX SWITCHER

- I/O sizes from 16x16 to 144x144
- High speed digital switching - up to 4.25 Gbps
- Multimode and singlemode I/O boards available
- Modular, field-upgradeable and hot-swappable design
- Dual redundant and hot-swappable power supplies
- Hot-swappable I/O boards
- IP Link® Ethernet monitoring and control
- Global presets for storing commonly used switching configurations
- I/O rooming and grouping
- RS-232 and RS-422 serial control

The Extron FOX 4G Matrix 14400 is a high performance, modular fiber optic matrix switcher for systems requiring complete, end-to-end digital A/V signal transmission and routing over fiber optic cable. Using a modular, card cage design, the matrix is expandable from 16x16 up to 144x144, and provides digital switching for data rates up to 4.25 Gbps. With hot-swappable input/output boards and fully redundant power supplies as well as real-time system monitoring, the FOX 4G Matrix 14400 is ideal for mission-critical environments requiring 24-hour reliability and continuous operation.

DESCRIPTION

The Extron **FOX 4G Matrix 14400** is a high performance, modular fiber optic matrix switcher for complete, end-to-end digital A/V signal transmission and routing over fiber optic cable. The FOX 4G Matrix 14400 is expandable in sizes from 16x16 up to 144x144, and is fully compatible with the FOX Series of fiber optic transmitters and receivers. Supporting rates up to 4.25 Gbps, it accepts and routes standard definition video, high resolution computer-video, DVI-D, and multi-rate SDI. Equipped with the integration-friendly features common to Extron matrix switchers, together with hot-swappable I/O boards and fan, real-time system monitoring, and redundant, hot-swappable power supplies, the FOX 4G Matrix 14400 delivers highly reliable, enterprise-wide switching of fiber optic A/V and control signals for any mission-critical environment.

Fiber Matrix Architecture

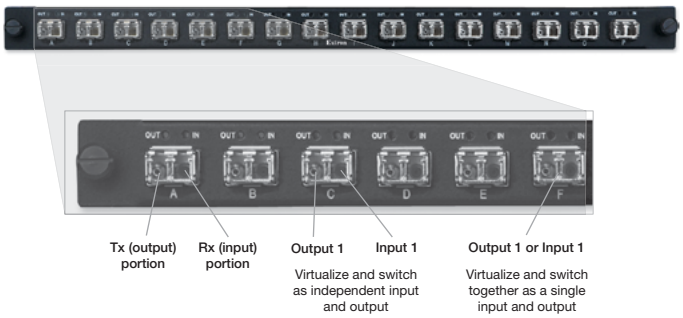
The FOX 4G Matrix 14400 is a modular design featuring nine board slots. Each slot accepts a FOX 4G Matrix I/O Board having sixteen ports populated with LC-type fiber optic connectors. Two versions of the board are available. The FOX 4G Matrix I/O Board - MM supports multimode fiber at 850 nm, which is typically used within buildings or facilities with moderate-range transmission distances. The FOX 4G Matrix I/O Board - SM supports singlemode as well as multimode fiber at 1310 nm. Singlemode fiber offers long-range transmission capability over extreme distances of several kilometers or miles. It is used in very large facilities, such as hospitals and stadiums, and for connecting over very long distances between facilities such as university campuses.

The FOX 4G Matrix 14400 can be configured with all or some of the board slots occupied. The I/O boards are hot-swappable and may be added at any time in the field for easy and quick upgradeability or expansion. The FOX 4G Matrix 14400 also accommodates any combination of singlemode or multimode I/O boards. This can allow, for example, a multimode fiber link input to the matrix switcher from a multimode transmitter, and a singlemode output from the switcher for transmission over extreme distances to a singlemode receiver.

I/O Configuration and Virtualization

Each fiber optic port comprises two individual fiber links. In the standard I/O configuration for the FOX 4G Matrix 14400, these links are defined as a separate input and a separate output. Therefore, up to 144 single fiber link inputs and 144 single fiber link outputs are possible when configuring and controlling the matrix switcher with the Extron control software. However, each fiber optic connection can also be defined as a "linked" input or output, with the two fiber optic links supporting bi-directional capabilities for a FOX Series product. Bi-directional communications between compatible transmitters and receivers enhances system integration by enabling box-to-box communications. This allows for streamlined set-up with Auto-Image™, RS-232 pass-through between distant locations, and enhanced monitoring with alarm notification capability.

Any group of linked connections, anywhere on the rear panel can be defined as inputs or outputs, enabling the creation of a virtualized, custom I/O configuration. For example, a FOX 4G Matrix 14400, populated with two I/O boards and 32 available linked connections, may be virtualized as a 24x8 switcher. In the standard I/O configuration, these same two boards would support 32x32 switching with single fiber link inputs and outputs. For added flexibility, the FOX 4G Matrix 14400 may be virtualized and configured with a combination of linked and single fiber link inputs and outputs.



8x8 I/O board - multimode and singlemode versions available.

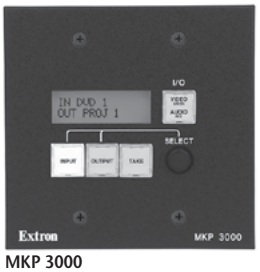
Familiar, Integrator-Friendly Matrix Switcher Features

Once the I/O virtualization has been defined, up to four smaller sub-switchers can be created by dividing up the matrix. For example, a portion of the switching may be dedicated to HD-SDI signals. Additionally, 32 memory presets are available for saving and recalling commonly used input and output ties. Furthermore, a rooming feature enables the creation of 10 rooms by groups of outputs, each with separate presets.

Self-Monitoring and Hot-Swappable

The FOX 4G Matrix 14400 is designed for optimum performance and reliability in applications requiring continuous operations 24 hours a day, 7 days a week, such as in government, military, and medical installations. A real-time monitoring system continuously provides self-diagnostics of the I/O boards, fiber links, power supplies, internal fans, and general functions of the switcher. LED indicators on each I/O board provide a quick verification of input signal presence as well as the status of fiber links with the transmitters and receivers. The FOX 4G Matrix 14400 can be configured to trigger an external control system, or generate e-mail alerts, when a fiber link has been lost.

Each I/O board is hot-swappable so that the matrix switcher can be serviced or reconfigured without interrupting all signal routing by powering down the unit. The FOX 4G Matrix 14400 also features a hot-swappable fan, and dual redundant and hot-swappable power supplies to ensure continuous, uninterrupted power.



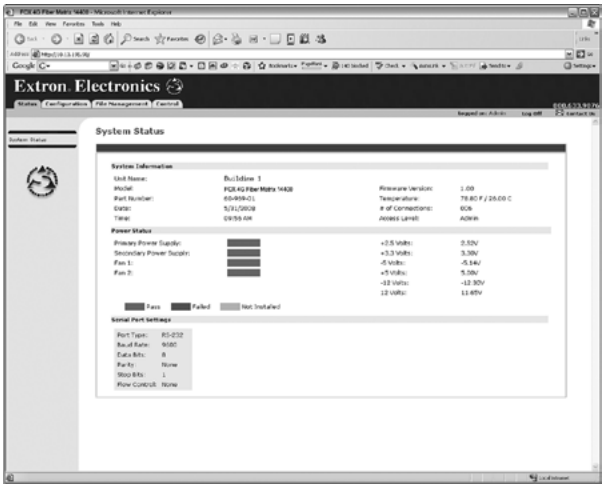
MKP 3000

Control

The FOX 4G Matrix 14400 offers convenient remote system access for configuration, I/O virtualization, operation, and monitoring through the front and rear panel RS-232 serial control ports and IP Link Ethernet control. The FOX 4G Matrix 14400 is also compatible with the FPC 5000 Front Panel Controller and the MKP 3000 X-Y Remote Control Panel, both of which provide a convenient user interface to the matrix switcher from remote locations.

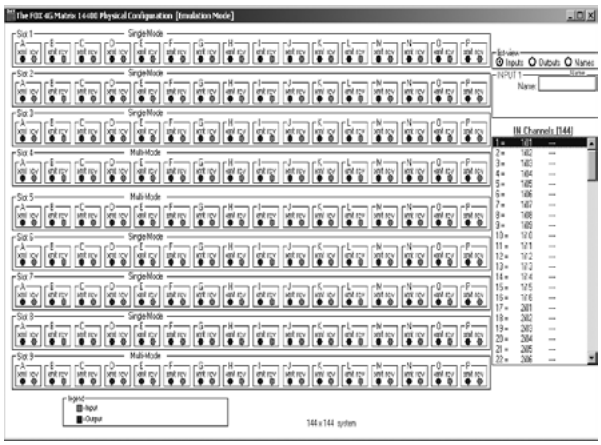
FEATURES

- **I/O sizes from 16x16 to 144x144**
- **High speed digital switching up to 4.25 Gbps** – The FOX 4G Matrix 14400 offers up to 4.25 Gbps digital switching capability for routing audio, control, and video signals at high resolution rates and multiple formats with uncompressed, pixel-for-pixel throughput. This level of performance assures compatibility from standard definition video to the highest source resolutions, including RGB computer-video, DVI, and multi-rate SDI signals.
- **Multimode and singlemode I/O boards available** – The FOX 4G Matrix 14400 is configurable with a mix of multimode and singlemode versions of the FOX 4G Matrix I/O Boards, so that both short and long haul transmission can be supported.
- **Modular, field-upgradeable and hot-swappable design** – The FOX 4G Matrix 14400 provides substantial flexibility, expandability, and affordability by allowing users to select the configuration required for their systems. Additional input and output boards may be added at any time for easy and quick upgradeability or expansion. Hot-swappable components allow the user to replace an I/O board, power supply, or the fan at any time—no need to power down the switcher. This is especially useful for mission-critical applications that require continuous operation of the FOX 4G Matrix 14400.
- **Dual redundant and hot-swappable power supplies** – Primary and back-up power supplies provide added reliability for critical applications.
- **I/O virtualization** – Allows for virtualized matrix switcher configurations from 16x16 to 144x144. Virtualized configurations can be combinations of bi-directional fiber connections and single fiber inputs and outputs.
- **Advanced computer-aided diagnostics** – Provides 24-hour self-diagnostics of input/output boards, primary and redundant power supply voltages, fiber links, and overall functional status of the matrix. Using the IP Link Ethernet or RS-232/RS-422 communications port, status monitoring is possible for off-site or unmanned locations, such as government, military, medical, or any other sensitive, 24 hour a day, 7 day a week environments.



Internal Web pages show detailed status information.

- **Input video signal detection** – The FOX 4G Matrix 14400 verifies active light sources by polling all connections for input reception and output transmission. The resulting information is viewable within the internal Web pages, and is easily obtained by third party control systems.
- **Status LED indicators for fiber link status** – LEDs on each I/O board verify active fiber links with the transmitters and receivers.
- **Alarm notification for fiber link loss** – The FOX 4G Matrix 14400 can be set up to trigger an external control system, or generate e-mail alerts for immediate notification when a fiber link has been lost.
- **Two AC power inputs** – For added power reliability, some 24-hour environments offer two separate AC power sources, one as the primary source and the second for redundancy. The FOX 4G Matrix 14400 offers two AC power inputs for continuous connection to both power sources.
- **Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment**
- **View I/O mode** – Users can easily view which inputs and outputs are actively connected from the RS-232 or RS-422 serial port or IP Link Ethernet port.
- **I/O grouping** – Allows the matrix switcher to be virtually divided into smaller sub-switchers, making installation and control easier. I/O grouping allows specific outputs, like those designated for a specific video format, to be grouped together.
- **Global presets** – Frequently used I/O configurations may be saved and recalled via IP Link or serial control. This time-saving feature allows I/O configurations to be set up and stored in memory for future use.
- **Extron control software** – For serial or Ethernet remote control from a PC, the included Windows®-based control software features a graphical, drag-and-drop interface to make I/O configuration and other customization functions simple and convenient. This software also offers an emulation mode for configuration of an offsite matrix switcher; the I/O configuration may then be saved for future downloading to the matrix switcher.



FEATURES

- **Rooming** – The FOX 4G Matrix 14400 can be configured to group selected outputs into specific "rooms," each with its own set of unique presets. A total of 10 rooms, with 10 presets per room, are available.
- **IP Link Ethernet monitoring and control** – Engineered to meet the needs of professional A/V environments, IP Link enables the FOX 4G Matrix 14400 to be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols. IP Link provides for remote selection of input and output ties, system set-up and configuration, and advanced system diagnostics.
- **RS-232 and RS-422 serial control port** – Using serial commands, the FOX 4G Matrix 14400 can be controlled and configured via the included Windows-based control software, or integrated into third-party control systems. Extron products use the SIS™ - Simple Instruction Set command protocol, a set of basic ASCII code commands that allow for quick and easy programming. The RS-232 and RS-422 port also makes it easy to install firmware updates.
- **Front panel configuration port** – A front panel serial port allows easy accessibility for configuring the FOX 4G Matrix 14400 without having to access the rear panel.
- **Rack-mountable 8U, full rack width metal enclosure**

FPC 5000 Front Panel Controller

Available for the FOX 4G Matrix 14400 is the FPC 5000 Front Panel Controller, an intuitive, 12.1 inch touch-screen, control interface. The easy-to-use FPC 5000 can control, monitor, access, and manage all of the FOX 4G Matrix 14400 matrix switcher set-up and control functions via an intuitive, menu-driven interface. Any user, regardless of their technical proficiency, can easily navigate through its simple and straightforward menus to change, monitor, or control the features of the FOX 4G Matrix 14400. With IP Link Ethernet capabilities, it can access the matrix from anywhere on a network, from multiple sites, as well as via the Internet. Housed within a 7U panel, the FPC 5000 can be installed in a rack, podium, or control console.

SPECIFICATIONS

NOTE: The I/O cards are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

OPTICAL SPECIFICATIONS

Number/type	16 singlemode or 16 multimode fiber optic inputs and outputs (16 Tx and 16 Rx) per I/O card
Connectors	16 bidirectional LC connectors per I/O card
Operating distance	30 km (18.75 miles) with singlemode (SM) cables 0.15 km (492') with multimode (MM) cables

NOTE: Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Nominal peak wavelength	850 nm for multimode (MM), 1310 nm for singlemode (SM)
Transmission power	
Singlemode	-5 dBm, typical
Multimode	-5 dBm, typical
Maximum receiver sensitivity	
Singlemode	-18 dBm, typical
Multimode	-12 dBm, typical
Optical loss budget	
Singlemode	13 dB, maximum
Multimode	7 dB, maximum
Maximum channel data rate	4.25 Gbps

VIDEO

Routing	16x16 up to 144x144 unidirectional (Tx) matrix or 8x8 up to 64x64 bidirectional (Tx/Rx) matrix
Gain	Unity
Pixel data bit depth	8 bits per channel, 3 channels (R, G, B)

VIDEO/AUDIO INPUT

Number/signal type	16 to 144 fiber optic signals
Connectors	16 LC connectors per I/O card

VIDEO/AUDIO OUTPUT

Number/signal type	16 to 144 fiber optic signals
Connectors	16 LC connectors per I/O card

CONTROL/REMOTE — SWITCHER

Serial control port	1 bidirectional RS-232 or RS-422, 9-pin female D connector (rear panel) 1 bidirectional RS-232, 2.5 mm mini stereo jack (front panel)
Baud rate and protocol	9600 to 115200 baud, 9600 baud (default), 8 data bits, 1 stop bit, no parity
Ethernet control port	1 RJ-45 female connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, DHCP, ICMP (ping), TCP/IP, UDP, Telnet, HTTP, SMTP
Web server	Up to 200 simultaneous sessions 7 MB nonvolatile user memory
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer ver. 6 or higher, Telnet

GENERAL

Power*	2 (positive-negative), 100 VAC to 240 VAC, 50/60 Hz; internal, 400 watts each Enclosure without cards: 100 watts at 115 VAC, 60 Hz Enclosure fully loaded with 9 cards: 235 watts at 115 VAC, 60 Hz Each module card: 15 watts at 115 VAC, 60 Hz *A redundant power supply is standard.
Cooling	Fan, right to left (as viewed from front panel)
Rack mount	Yes
Enclosure type	Metal
Enclosure dimensions	14.0" H x 17.0" W x 12.25" D (8U high, full rack wide) 35.6 cm H x 43.1 cm W x 31.1 cm D (Depth excludes connectors and handles. Width excludes rack ears.)
Product weight (fully loaded)	38.5 lbs (17.5 kg)
Shipping weight	47.5 lbs (21.6 kg)
DIM weight	
USA/Canada	146 lbs (63 kg)
International	171 lbs (78 kg)
Vibration	STA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE: All nominal levels are at ±10%.

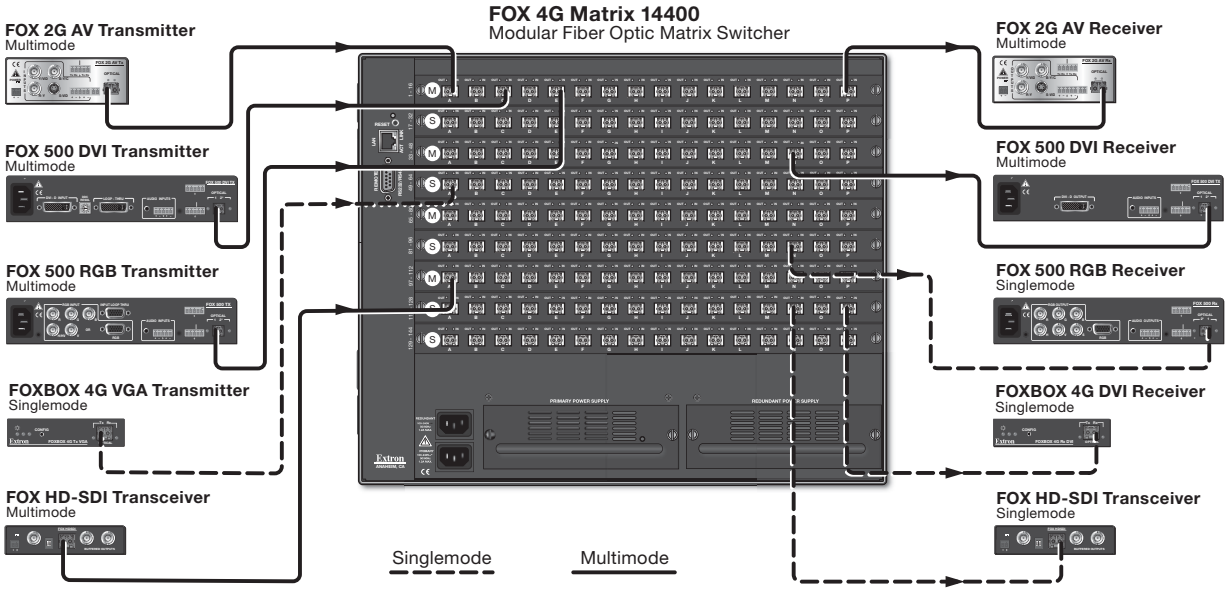
Model	Version Description	Part Number
FOX 4G Matrix 14400	Modular Fiber Optic Frame	60-969-01
FOX 4G Matrix I/O Board - MM	Multimode	70-771-01
FOX 4G Matrix I/O Board - SM	Singlemode	70-771-02

Optional Accessories

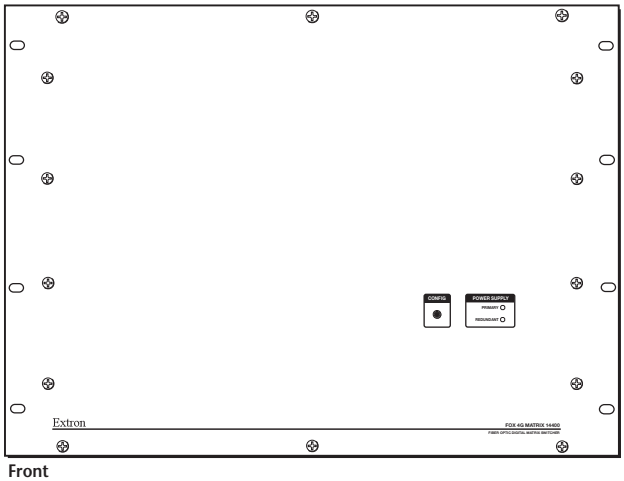
FPC 5000	Front Panel Controller	60-503-01

Specifications are subject to change without notice.

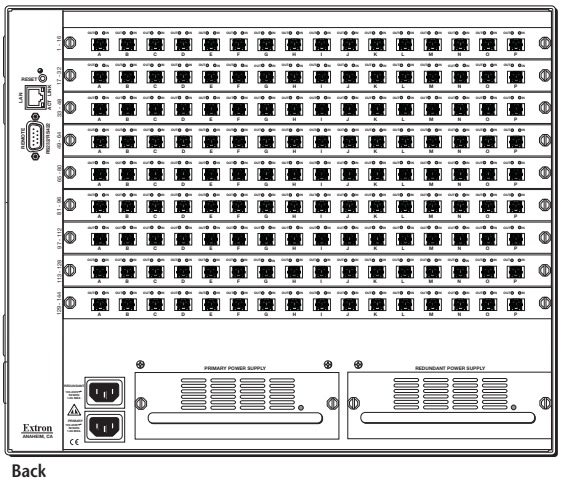
APPLICATION DIAGRAM



PANEL DRAWINGS



Front



Back

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